



## Pests and Pesticides in Child-serving Facilities: An IPM Newsletter

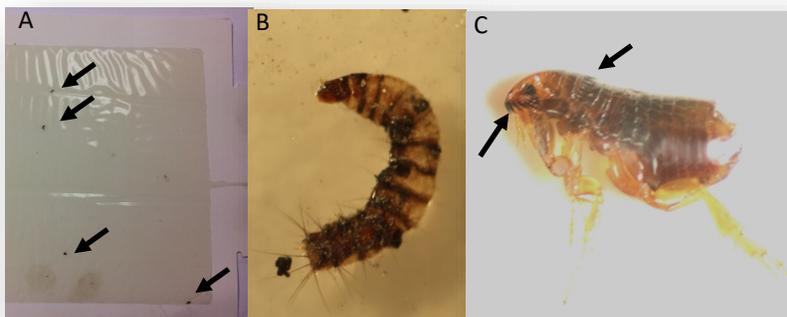
### Fleas in the classroom

Karen M. Vail

As I reflect upon the past year, two somewhat unusual pest related occurrences stand out to me. I'll report on flea activity in this newsletter and the increase in delusory parasitosis in the next.

Although adult cat fleas can bite humans, they cannot develop and reproduce on human blood if a viable host (cat, dog, opossum, raccoon, etc.) is absent. When fleas are found in schools, it's usually due to one of these hosts living inside or nearby, or students/staff transporting the adult fleas to the structure.

Flea eggs are laid on the host animal, fall off the host and the larvae hatch to feed on partially digested blood and other organic matter in the environment. They go through several molts before pupating. The pre-emergent adults will wait for a stimulus (heat, vibration, pressure) to indicate a host is nearby and can persist in this stage for 5 months or more. Flea management at a school usually requires finding and removing the host animal and sealing host entry points, or determining who is responsible for bringing the fleas to prevent future introductions. Below is a description of a cat flea infestation that occurred at a Tennessee childcare this summer and management practices needed to resolve the situation.



A glue board from the complaint classroom with two larvae (upper arrows) and two adult (lower arrows) cat fleas (A), close-up of larva (B) and pronotal comb and genal comb with the most anterior spine nearly as long as the second spine in the close-up of the adult cat flea (C). Photo: Karen Vail, UT E&PP

Sometime in August, personnel in a childcare facility were finding fleas in the lower floor classroom which sits on a slab. This is a multi-story nearly 90-yr old brick structure. To the west, the rest of the

Although adult cat fleas can bite humans, they cannot develop and reproduce on human blood if a viable host (cat, dog, opossum, raccoon, etc.) is absent.

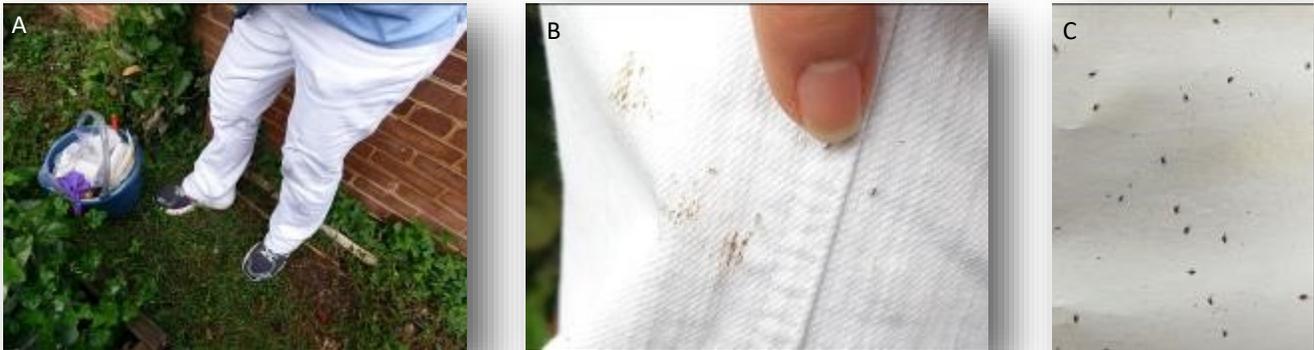
### This issue

Fleas in the classroom	1
Links	4

building sits on a crawlspace of differing depths. During the summer, some of the students noted their pets from home had fleas. By the time the flea problem at the childcare was reported, these students were no longer at the childcare. Treatment of the fleas was somewhat difficult to discern as two pest management firms were involved, initially unbeknownst to each other. Evidently the childcare was sprayed over the weekend by the second company, but the original pest managers with responsibilities for this site were called to follow up after fleas were still seen on Monday.

The original pest managers then regularly vacuumed the premises and removed a jute rug from the complaint classroom. Vacuuming serves many purposes when managing fleas: it removes the adult biting stage of the flea and its dried fecal blood which serves as a food source for the larva; removes a good proportion of the eggs (less larvae are removed because they can wrap around carpet fibers and other similar objects, although most of the floors were now tile); and the vibration stimulates the pre-emergent adults to leave the cocoon. After use, vacuum cleaner contents should be emptied into a plastic bag and the bag sealed to prevent fleas from escaping.

Larval and adult cat fleas were found on a glue board which had been placed in the classroom. The presence of larval fleas could indicate a viable host was present. It was unlikely that that the larvae crawled an inch or more onto the glue board, they were likely dropped onto the board when the rug was removed or fell from another infested item.



White pants allow fleas to be easily seen during an inspection (A,B). A lint roller sheet can be used to easily remove fleas from the pants after inspecting each area to help delineate which areas are most active (C). Photo: Jennifer Chandler, UT E&PP.



Three adult flea hot spots were found including the outside area near the laundry room (feathers were found in the vent and inside the room on a glue board, A), the damaged screen entry to the crawlspace at the far end of the building (B) and in the crawl space (ladder leads to crawl, C). Photo: Jennifer Chandler, UT E&PP.

Adult flea activity continued into mid-September at which time the UT Urban IPM Lab personnel joined the original pest managers in an inspection of the facility. White pants and a lint roller helped determine where the flea populations were the greatest. An abundance of adult fleas were found in the front of the building near the kitchen/laundry room which was one room away from the complaint classroom, near a damaged crawl space vent screen at the opposite end of the building from the complaint room, and in the crawl space (which stopped one room away from the complaint room). Previous trapping outside the damage crawl space vent had yielded a feral cat. Over the following weeks, 2 raccoons and another feral cat had been caught outside the damaged crawl space vent (which had been repaired), and an opossum had been trapped in the crawl space.

Flea sightings were always greatest on Monday and then trailed off during the week which caused the pest managers to suspect someone was bringing in a pet over the weekend, but no one admitted to doing so and the effort stopped short of installing surveillance cameras. Flea activity complaints continued until mid-October or so.

Pre-emergent adults in the cocoons in the crawlspace or cracks and crevices in the less visited areas of the facility would have little stimulus to emerge and could prolong the presence of fleas in the childcare. Fleas inside the cocoon are protected from insecticidal sprays so it isn't very helpful to apply insecticides at this point. Vacuuming is a better option because it causes the adults to emerge from the cocoon and removes the adults. Steam cleaning is another viable option especially if upholstered furniture is present or vacuuming cannot reach all areas, but take precautions to prevent damaging items when steaming.

More information on managing fleas can be found in the following references, but not all management information pertains to schools.

Merchant, M. 2017. SPN: Fleas and Ticks. <https://schoolipm.tamu.edu/2017/04/25/spn-fleas-and-ticks/>

Vail, K.M. 2006. Chemical and Non-chemical management of fleas. <https://extension.tennessee.edu/publications/Documents/PB1596.pdf>



To eliminate fleas in a classroom where no pets are kept, its important to locate the viable host and remove it or deny its access to the school property. Search the perimeter of the structure and the landscape for signs (tracks, burrows, feces, etc.) of vertebrate pests that may be serving as the flea host. Vertebrate hosts may also be nesting in the crawl space (as in the case provided here), attic, chimney or wall voids.

## This newsletter produced by:

Karen Vail, Ph.D., Professor,  
 Extension Urban Entomologist  
 Entomology and Plant Pathology  
 370 Plant Biotechnology Bldg.  
 2505 E J Chapman Drive  
 Knoxville, TN 37996-4560  
 ph: (865) 974-7138  
 fax: (865) 974-8868  
 email: [kvail@utk.edu](mailto:kvail@utk.edu)  
 web: <http://schoolipm.utk.edu>  
<https://ag.tennessee.edu/EPP/Pages/Vail.aspx>



Jennifer Chandler,  
 Research Specialist III  
 Entomology and Plant Pathology  
 370 Plant Biotechnology Bldg.  
 2505 E J Chapman Drive  
 Knoxville, TN 37996-4560  
 ph: (865) 974-7138  
 fax: (865) 974-8868  
 Email: [jchand11@utk.edu](mailto:jchand11@utk.edu)

Comments or questions  
 on this newsletter?

Contact [kvail@utk.edu](mailto:kvail@utk.edu)

Follow us on  
 Facebook at



[http://tinyurl.com/  
 UrbanIPMTN](http://tinyurl.com/UrbanIPMTN)

*The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services. All qualified applicants will receive equal consideration for employment without regard to race, color, national origin, religion, sex, pregnancy, marital status, sexual orientation, gender identity, age, physical or mental disability, or covered veteran status.*

For more information about IPM in Tennessee schools and other facilities, or to view past issues of *Pests and Pesticides in Child-serving Facilities*, please visit [schoolipm.utk.edu](http://schoolipm.utk.edu).

### NATIONAL IPM INFORMATION

eXtension's Pest Management In and Around Structures: Urban Integrated Pest Management [http://www.extension.org/urban\\_integrated\\_pest\\_management](http://www.extension.org/urban_integrated_pest_management)

National School IPM  
[schoolipm.ifas.ufl.edu/](http://schoolipm.ifas.ufl.edu)

IPM in Schools Texas  
<http://schoolipm.tamu.edu/>

IPM Institute of North America  
[www.ipminstitute.org/](http://www.ipminstitute.org/)

School IPM PMSP—all schools IPM by 2020 <https://ipminstitute.org/projects/school-ipm-2020/>

National Pest Management Association IPM  
[www.whatisipm.org/](http://www.whatisipm.org/)

EPA schools  
<http://www2.epa.gov/managing-pests-schools>

For further information about the IPM program at your school or in your county, contact your county Extension Agent or the school IPM Coordinator. For county agent contact information, please visit <https://extension.tennessee.edu/Pages/Office-Locations.aspx>

## Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

## Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.